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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,582	09/15/2003	Jack L. Jewell	PICO-0047-1	8055

7590 12/21/2005

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EXAMINER
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VAN ROY, TOD THOMAS

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 12/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/661,582

Applicant(s)

JEWELL, JACK L.

Examiner

Tod T. Van Roy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 57-65 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 57-59, 61-62, 64-65 is/are rejected.
- 7) ☒ Claim(s) 60, 63 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments, see Remarks, filed 10/03/2005, with respect to the rejection(s) of claim(s) 57-65 under 35 USC 103a have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly found prior art.

### ***Claim Rejections - 35 USC § 102***

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 57-59 and 61-62 are rejected under 35 U.S.C. 102(a) as being anticipated by Evans et al. (Evans et al., "Edge-Emitting Quantum Well Heterostructure Laser Diodes with Auxiliary Native-oxide Vertical Confinement" Applied Physics Letters, vol. 67, pp. 3 168-3 170 (Nov.1995)).

With respect to claim 57, Evans discloses a light emitting device comprising a first mirror (col.2 para.1), a light emitting active layer disposed above the first mirror (col.2 para.1), at least a first oxidizable layer having an oxidized region which is significantly oxidized (fig.1 AlGaAs confinement layer), said first oxidizable layer being disposed above said light emitting active layer, at least one semiconductor layer residing above at least a portion of said oxidizable layer (fig.1 GaAs contact layer above the oxidizable layer), a second mirror disposed above said light emitting active layer (col.3 para.2 lines 41-42), top (fig.1 p+GaAs) and bottom (col.3 para.1 lines 14-15) electrical contacts disposed to communicate with said light emitting active layer, and

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interconnect metallization deposited above at least a portion of said semiconductor layer and in contact with said top electrical contact (fig.1 Ag).

With respect to claim 58, Evans further discloses said first oxidizable layer further comprises a second region which is not significantly oxidized (fig.1 middle of AlGaAs layer).

With respect to claim 59, Evans further discloses at least one basin disposed proximal to said oxidized region (fig.1 oxidation trench).

With respect to claim 61, Evans further discloses said top contact is characterized by a center (GaAs layer has a center region over which the Ag is disposed).

With respect to claim 62, Evans further discloses at least one pit disposed proximal to said oxidized region (fig.1 oxidation trench) said pit not hemming said center.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 57 is rejected under 35 U.S.C. 102(e) as being anticipated by Choquette et al. (US 5493577).

With respect to claim 57, Choquette discloses a light emitting device comprising a first mirror (fig.1 #14), a light emitting active layer disposed above the first mirror (fig.1 #30), at least a first oxidizable layer having an oxidized region which is significantly

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oxidized (fig.1 #20), said first oxidizable layer being disposed above said light emitting active layer, at least one semiconductor layer residing above at least a portion of said oxidizable layer (fig.1 lowest layer of type #36)), a second mirror disposed above said light emitting active layer (fig.1 #16), top (fig.1 formed of top layer of top mirror stack) and bottom (fig.1 formed of substrate #12) electrical contacts disposed to communicate with said light emitting active layer, and interconnect metallization deposited above at least a portion of said semiconductor layer and in contact with said top electrical contact (fig.1 #22).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 64-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choquette in view of Lee et al. (US 5115442).

With respect to claims 64-65, Choquette teaches the light emitting device as outlined in the rejection to claim 57, including the semiconductor layer to be above the oxide region, but does teach the semiconductor layer to have an ion implantation region. Lee teaches a light emitting device that has a large ion implantation region (fig.2 darkened regions #25 which include the semiconductor layers above the active region). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the light emitting device of Choquette with the ion implantation of Lee in order to further facilitate, by beginning the confinement at a layer more closely located to the injection aperture, the directing of the injected current into the middle of the active region as shown in fig.2 of Lee, and fig.1 of Choquette.

#### ***Allowable Subject Matter***

Claims 60 and 63 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 60 and 63 are believed to be allowable based on the fact that the prior art did not teach the pit regions to be used to oxidize the correct layers as limited by claim

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57. Claim 57 requires the oxidizable layers to be found above the active region. Evans teaches the pit to be used to oxidize the lower DBR layers, and not the top oxidizable layer which meets the claim language. The prior art did teach oxidization of semiconductor layers for current confinement, much like those taught in the Choquette reference, but were not found to teach the method of first forming a pit, then using the pit as an access point to form the oxide in the specified location.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

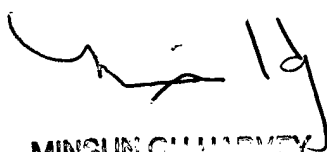
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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TVR

  
MINSUN CHIU  
PRIMARY EXAMINER